1   MORRISON & FOERSTER LLP
    MICHAEL A. JACOBS (Bar No. 111664)
2   mjacobs@mofo.com
    MARC DAVID PETERS (Bar No. 211725)
3   mdpeters@mofo.com
    DANIEL P. MUINO (Bar No. 209624)
4   dmuino@mofo.com
    755 Page Mill Road, Palo Alto, CA 94304-1018
5   Telephone: (650) 813-5600 / Facsimile: (650) 494-0792

6   BOIES, SCHILLER & FLEXNER LLP
    DAVID BOIES (Admitted *Pro Hac Vice*)
7   dboies@bsfllp.com
    333 Main Street, Armonk, NY 10504
8   Telephone: (914) 749-8200 / Facsimile: (914) 749-8300
    STEVEN C. HOLTZMAN (Bar No. 144177)
9   sholtzman@bsfllp.com
    FRED NORTON (Bar No. 224725)
10 fnorton@bsfllp.com
    1999 Harrison St., Suite 900, Oakland, CA 94612
11 Telephone: (510) 874-1000 / Facsimile: (510) 874-1460
    ALANNA RUTHERFORD (Admitted *Pro Hac Vice*)
12 575 Lexington Avenue, 7th Floor, New York, NY 10022
    Telephone: (212) 446-2300 / Facsimile: (212) 446-2350 (fax)
13
    ORACLE CORPORATION
14 DORIAN DALEY (Bar No. 129049)
    dorian.daley@oracle.com
15 DEBORAH K. MILLER (Bar No. 95527)
    deborah.miller@oracle.com
16 MATTHEW M. SARBORARIA (Bar No. 211600)
    matthew.sarboraria@oracle.com
17 500 Oracle Parkway, Redwood City, CA 94065
    Telephone: (650) 506-5200 / Facsimile: (650) 506-7114
18
    Attorneys for Plaintiff
19 ORACLE AMERICA, INC.

20   **UNITED STATES DISTRICT COURT**

21   **NORTHERN DISTRICT OF CALIFORNIA**

22   **SAN FRANCISCO DIVISION**

23 ORACLE AMERICA, INC.   Case No. CV 10-03561 WHA

24   Plaintiff,   **DECLARATION OF STEVEN M.**
                                            SHUGAN IN SUPPORT OF ORACLE
25   v.   **AMERICA, INC.'S MOTION TO**
                                            EXCLUDE THE EXPERT REPORTS OF
26 GOOGLE, INC.   **GREGORY K. LEONARD AND ALAN J.**
                                            COX
27   Defendant.

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1   I, STEVEN M. SHUGAN, declare as follows:

2   1.   I have been retained as an expert in this matter and conducted a study to evaluate the

3   enhancements enabled by the use of the copyrights and patents that Google is alleged to have infringed,

4   which is referred to as a conjoint analysis. In this declaration, I address certain aspects of the expert

5   report of Dr. Gregory K. Leonard as it related to my conjoint analysis.

6   **Background**

7   1.   I am currently the McKethan - Matherly Eminent Scholar and Professor at the University

8   of Florida, where I teach multivariate statistics, marketing models and advanced marketing

9   management. I hold a Ph.D. in Managerial Economics from Northwestern University and my research

10   includes services marketing (integrating operations), statistics, metrics, entertainment marketing,

11   advance-selling, normative methods for modeling competition, markets for evaluative information, and

12   models of selling and product policy. I was formerly a full professor at the University of Chicago for

13   13 years, and I have taught marketing, econometrics, statistics, and computer science at various

14   universities, including the University of Rochester, SDA Bocconi (Milano) and Northwestern.

15   2.   I was editor-in-chief of *Marketing Science* for six years, editor of *Journal of Business*

16   and associate editor of *Management Science*, and I served on over 10 editorial boards including the

17   *Journal of Consumer Research*, *Journal of Marketing* and *Journal of Marketing Research*. I have

18   numerous publications (including 27 editorials and commentaries) and have made over one hundred

19   professional presentations in more than 22 countries. Much of my work involves the evaluation of

20   marketing research tools including sample surveys.

21   3.   I am an INFORMS (Institute for Operations Research and the Management Sciences)

22   Fellow as well as an Inaugural Fellow of the Society for Marketing Science. I won several best paper

23   awards (including twice *Marketing Science Institute/Paul Root Award*, *Journal of Marketing*, *Journal*

24   *of Retailing,* finalist *Journal of Service Research*, and finalist *Journal of Marketing Research*) and best

25   teaching awards. I won the INFORMS service award in 2008 and have received awards from several

26   universities. I have consulted for numerous firms on marketing and market research issues, including

27   Accusoft Pegasus (2010), Apple (2011), AIG Domestic Claims (2009) and NIDA Corporation (2001).

28   I have written commercial software including a simulation game, and I have served on numerous

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1   committees including the tenure and promotion committees at both the University of Chicago and the

2   University of Florida (chair). I was past chairman of the INFORMS College on Marketing and twice

3   organizer of the Marketing Science Conference, and I have served as chair of numerous dissertation

4   committees.

5   4.   My fields of specialization within marketing include marketing strategy, marketing

6   research, quantitative models, and consumer decision making. In the course of my scholarly research,

7   teaching, editorial work, and consulting work, I have studied issues of marketing research, product

8   design, development and features, branding, and pricing, and their roles in consumer preferences and

9   choice. During my career, I have taught managers, M.B.A. students, and doctoral students about,

10 written textbook chapters on, evaluated articles for publication on, and conducted conjoint analysis.

11   5.   On September 12, 2011, I submitted a report ("Shugan Report") that described how I

12 conducted a comprehensive study of smartphone consumers involving the feature enhancements that

13 are presumed to be related (directly or indirectly) to the infringement of the patents-in-suit and Java

14 copyrights, and my conclusions based on that study.

15   6.   On October 10, 2011, I submitted a reply report in which I comment on the expert report

16 of Dr. Gregory K. Leonard (the "Leonard Report") as it related to my analyses.

17   7.   I have been asked by counsel for Oracle America, Inc. ("Oracle") to review and

18 comment upon the methodologies employed in the Leonard Report relating to conjoint analysis. As I

19 detailed in my October 10, 2011, reply report ("Shugan Reply Report"), Dr. Leonard has critiqued

20 choice-based conjoint surveys in ways that run directly contrary to nearly every article in the academic

21 literature. He can only reach his conclusions by severely mischaracterizing certain articles and taking

22 other articles from unrelated fields out of context.

23   8.   As a trained academic, I expect that in any complex area of research or analysis, there

24 will often be occasions when well-informed, rigorously trained experts will have reasonable grounds to

25 disagree. Dr. Leonard's critique of my conjoint analysis, however, is not an example of such a

26 reasonable disagreement. Based on my own training, expertise, familiarity with the relevant literature,

27 and review of Dr. Leonard's Report, it is my conclusion that Dr. Leonard's discussion of my conjoint

28 analysis fails to understand or apply the basic principles that are accepted in the field of survey-based

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1   research. Over the course of my career, I have been part of the peer review process for at least 23

2   scholarly peer-reviewed academic journals, and have personally reviewed hundreds (if not, thousands)

3   of articles for submission in academic journals. Dr. Leonard's analysis suffers from sufficient

4   ambiguities, errors and misrepresentations that any submitted article based on that analysis would not

5   survive a peer-review process of a scholarly journal. As a consequence, it is my opinion that Dr.

6   Leonard's critique is not the product of reliable principles or methods.

7   **Dr. Leonard appears to be biased against survey-based research**

8   9.   Dr. Leonard begins his critique of my conjoint analysis by stating that "Economists

9   have long been wary of attempts to measure preferences based on statements, rather than on actual

10   actions where money is at stake. Accordingly, survey-based methods that ask respondents to state their

11   preferences for a good, either by direct elicitation or by presenting respondents with hypothetical

12   choices, are controversial in economics." (Leonard Report, p. 109.) Dr. Leonard's antipathy toward

13   survey-based research suggests – and his uninformed analysis confirms – that he is unfamiliar with the

14   methods, literature, and science that have been thoroughly researched, exhaustively tested, and widely

15   accepted in the field in which I have practiced for 38 years. In fact, survey-based methods such as the

16   conjoint analysis that I conducted here have proven to be reliable and accurate predictors of consumer

17   behavior in thousands of studies, in academia, government, and commerce.

18   **Dr. Leonard demonstrates unfamiliarity with the relevant literature**

19   10.   Dr. Leonard's misunderstanding of the teachings of marketing and conjoint literature

20   apparently causes him to badly mischaracterize the conjoint analysis that I performed. Specifically, Dr.

21   Leonard has claimed that conjoint studies like the survey and analysis that I designed and performed in

22   this case are subject to serious "hypothetical bias." Dr. Leonard claims that "There is vast literature on

23   this subject" (Leonard Report p. 109) in the economics, marketing, and survey literature (p. 108) and

24   that there are "established results in the literature demonstrating hypothetical bias in conjoint studies"

25   (Leonard Report p. 111) and, accordingly, that my "survey results do not form a reliable basis for

26   calculating damages in this case" (Leonard Report p. 108). None of these statements is true. Despite

27   hundreds (if not thousands) of published articles on conjoint analysis in the top peer-reviewed

28   marketing journals, contrary to Dr. Leonard's claims, only a extremely small number even mention so-

1 called "hypothetical bias." Thus far, the literature indicates that the potential for hypothetical bias is

2 only apparent when one is evaluating consumer preferences for abstract goods, such as environmental

3 goods or risky options, and is not a function of survey design.

4   11.   Dr. Leonard makes four categories of errors that render his opinions unsupportable.

5   12.   **First,** Dr. Leonard relies on articles (Diamond and Hausman (1994)) from the

6 environmental economics field, not marketing literature. Such studies are irrelevant to assessing the

7 reliability of a conjoint study for purposes of this matter because problems with evaluating consumer

8 preferences for public goods (e.g., improving the environment), particularly those with indirect value,

9 can lead to difficulties in measuring consumer preferences through surveys. Such public goods are not

10 present in this matter. Even a recent extensive survey article from the environmental-economics field

11 has affirmed that choice-based conjoint analysis – the method I used – minimizes so-called hypothetical

12 bias in part, because, "choice formats, like conjoint, allow respondents to directly express ambivalence,

13 indifference or uncertainty." (*See* Murphy, Allen, Stevens, and Weatherhead (2005).)

14   13.   **Second,** Dr. Leonard cites articles from the consumer behavior and psychological

15 literature for propositions that they do not contain. For example, Dr. Leonard cites the Bettman, Luce,

16 and Payne (1998) article for the proposition that "the survey itself can create the 'preferences' that are

17 reflected in respondents' answers to the choice tasks." (Leonard Report p. 110.) Yet that article does

18 not consider conjoint analysis or hypothetical bias.

19   14.   **Third,** Dr. Leonard cites articles for propositions that they in fact reject. For example,

20 he cites the Miller et al. (2011) article for the proposition that "[c]onjoint stated preference surveys are

21 as susceptible to hypothetical bias as other types of stated preference surveys." (Leonard Report p.

22 109.) But the Miller et al. article goes on to conclude the opposite: "Our mean bias analysis uses the

23 criterion of overlapping confidence intervals and ***cannot confirm*** the existence of a hypothetical bias.

24 This result suggests that in our data set, all methods have a high convergent validity in measuring

25 consumers' mean WTP [willingness to pay]." (Emphasis added.) In other words, this article concludes

26 that even if hypothetical bias were present for a particular product, it would be unlikely to affect the

27 resulting willingness to pay measure. Moreover, this article concludes that even if hypothetical bias is

28 present, conjoint analysis "may still lead to the right demand curves and right pricing decisions." Thus,

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1   Dr. Leonard's own citation contradicts the claim in his report that "preference surveys, such as the

2   Shugan survey, are susceptible to serious biases." (Leonard Report, p. 108.)

3   15.   **Fourth,** Professor Leonard ignores the literature—even the articles that he himself

4   cites—that recognize that conjoint analysis methods and related choice-based survey methods are

5   routine and that their application is based on years of research. (*See* Miller et al. (2011).) Applications

6   of conjoint analysis occur in economics, marketing, psychology, statistics, market research, political

7   science, the survey literature, and many other areas (all areas that I have studied). In fact, surveys

8   involving hypothetical choices are commonly employed in nearly every sector of our economy by

9   managers, executives, public policy makers, politicians, regulators, the courts, and many others. The

10   number of applications of surveys and conjoint analyses involving hypothetical choices is too long to

11   list in a single document. Applications also permeate numerous areas, including political polls, public

12   policy, new product design, employee evaluations, and deceptive advertising claims. A simple Internet

13   search reveals the overwhelming number of published refereed articles in scholarly journals that

14   employ conjoint analysis. Examples of applications of conjoint analysis include the following (*See*

15   Orme 2010):

16   • Design of AT&T's first cellular telephone;

17   • Design and implementation of the EZ-Pass toll collection system;

18   • Development of new varieties of Mama Celeste pizzas;

19   • New logo design for the Baltimore Ravens football team;

20   • U.S. Navy reenlistment benefits;

21   • New services for the Ritz Carlton and Marriott hotel chains.

22   16.   As the sole support for his hypothetical-bias theory, Dr. Leonard has focused on two

23   articles by Professor Min Ding. Despite very widespread recognition of the validity of conjoint

24   analysis, a few recently published articles, most by Professor Ding, advocate a more complex form of

25   conjoint analysis, rather than rejecting conjoint analysis as Dr. Leonard implies, to eliminate so-called

26   hypothetical bias. Dr. Leonard's reliance on Professor Ding is misleading for three reasons: Professor

27   Ding's suggested approach to conjoint is untested and novel; Professor Ding's proposed more complex

28   conjoint is inappropriate for complex goods (Ding's 2005 article considers choices among Chinese

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1   dinners) and could not be used in this matter; and using Professor Ding's more complex conjoint would

2   likely lead to a conclusion that the value of the functionality enabled by the patents-in-suit and Java

3   copyrights was even greater.

4   17.   Professor Ding's improvement is untested, novel, and does not purport to undermine

5   conjoint analysis as a reliable and accurate tool. Whether promising or not, the improvement to

6   conjoint advocated by Professor Ding would not have been appropriate to use in this case. His new

7   improvement is not generally used by reputable survey firms and, unlike traditional methods, has not

8   been proven or widely adopted; it remains untested in the literature; and it is, at present, controversial.

9   Moreover, Professor Ding only claims to improve conjoint (not reject it) and he recognizes the fact that

10   conjoint has been widely accepted when stating: "Conjoint analysis is a centerpiece of marketing

11   research. Since the methodology was introduced to marketing approximately 30 years ago in a seminal

12   article by Green and Rao (1971), researchers have been continuously realizing new and major advances

13   in the field, including hierarchical Bayesian estimation." (*See* Ding 2007.)

14   18.   Professor Ding's proposed more complex conjoint is inappropriate for complex goods,

15   like smartphones. Professor Ding has stated that for Ding's approach, a potentially "serious

16   implementation challenge remains for expensive or complex products (e.g., automobiles) and for novel

17   products for which a prototype may not exist. In the case of expensive products, it may not be cost

18   effective to offer a real product to each study participant." (Ding, Grewal, and Liechty (2005).) My

19   survey, by contrast, used a main-stream approach employing well-tested survey methods.

20   19.   Dr. Leonard misrepresents the directional effect that Professor Ding's analysis could

21   have on my results. Even if there *were* such a thing as hypothetical bias with respect to consumer good

22   decision-making, the hypothetical bias discussed by Dr. Leonard likely would lead my results to

23   *understate* the value of the functionality enabled by the patents-in-suit and Java copyrights. As the

24   article by Ding concludes, any so-called hypothetical bias would lead to an undervaluation of

25   recognizable physical features. Ding (2007) hypothesizes that "[i]t is conjectured that under

26   hypothetical conditions, on average, participants tend to understate their valuation for physical features

27   they are likely to use (e.g., speakers, the power adapter) and to overstate their valuation for physical

28   features they are unlikely to use (cassette adapter)." Hence, even accepting Dr. Leonard's criticism as

1   valid (which it is not), it would have meant that respondents in the 2011 Smartphone Survey likely

2   underestimated the importance of application startup time because some applications are likely used on

3   their existing devices and startup time is obviously observed by all users. Thus, Professor Ding's

4   hypothetical bias (if relevant) would render my results less conservative.

5   **Dr. Leonard misapprehends basic principles of conjoint analysis**

6   20.   Preliminarily, Dr. Leonard describes my study as a "stated preference" study, and

7   criticizes it on that basis. That characterization is misleading and reflects a lack of understanding of

8   that term in the marketing literature because it confuses choices (preferences for products) with stated

9   preference surveys for product features. Choice-based-conjoint studies are specifically designed to

10   avoid the use of stated preference or ratings for product features and instead estimate preference values

11   as revealed through consumer choices (which account for trade-offs among features).

12   21.   Additionally, despite claiming that my survey was biased, Dr. Leonard has not

13   established the existence, direction, or extent of any bias in my survey. His critiques turn on the

14   omission of some features that he believes would affect consumer demand. In fact, such critiques again

15   reveal his lack of a basic understanding of conjoint analysis, as the inclusion of additional features

16   would make my survey less accurate, not more.

17   22.   Dr. Leonard claims that the survey respondents' stated preferences are susceptible to

18   hypothetical bias and therefore are inconsistent with so-called economic preferences, which he seeks to

19   impose on all buyers of Smartphones. Dr. Leonard imposed his own beliefs about consumer behavior

20   on the survey results (for instance, that all consumers always wants lower-priced items (Leonard Report

21   p. 114)) and claimed that the respondents' answers are unreliable because they do not fit his own

22   assumptions. However, the purpose of market research tools, such as conjoint analysis, is to determine

23   actual buyer preferences and not to assume what those preferences might be. For example, some

24   consumers may use price as a surrogate measure of unobserved qualities (e.g., durability) and focus

25   only on Smartphones in a particular price range and not consider cheap Smartphones. Some consumers

26   might buy only more expensive phones simply because they provide greater prestige. This consumer

27   behavior has been documented and discussed in the marketing literature, and is likely to be exhibited in

28   real world purchases. (*See* Shugan (1984), Mohr et al. (2005), Shiv et al. (2005), and Rao (2005).) Dr.

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1   Leonard's insistence that my survey is flawed because respondents did not invariably adhere to an

2   abstract economic principle that lower price must always be preferable once again betrays an

3   unfamiliarity with the relevant literature, as well as the dynamics of actual consumer behavior.

4   **Dr. Leonard misunderstands basic principles of statistical analysis**

5   23.   Dr. Leonard claims that I did not provide standard errors and confidence intervals for the

6   preference share calculations in my Expert Report. It appears that Dr. Leonard is unaware that standard

7   errors for the market simulations were included in the backup materials provided for my Expert Report

8   (Shugan Reply Report Exhibit 3). Claiming that I did not provide standard errors is simply incorrect.

9   24.   Furthermore, Dr. Leonard appears not to understand the meaning of the robustness

10   measures that I included in my Expert Report. Dr. Leonard incorrectly refers to robustness measures

11   such as U^2 and hit rate as "tests" for "hypothetical bias." Dr. Leonard appears not to understand that the

12   U^2 and hit rate values that I presented in my Expert Report indicate a very good model fit and indicate

13   that the data provide strong predictions of consumer choices (Shugan Report Table 2 p. 21). Both

14   indicate strong validity of the results (Shugan Report pp. 20-21). The average hit rate is 72.8 percent,

15   indicating that the model has good predictive abilities. Dr. Leonard's claim that my survey is not robust

16   is apparently based on a misunderstanding of my analysis and such standardized measures as U^2 and hit

17   rates.

18   **Conclusion**

19   25.   Dr. Leonard's observations regarding my report are irrelevant, inaccurate and

20   misleading. His report reveals both a strong bias against market research and a lack of basic knowledge

21   about the field of market research, conjoint studies, survey research or relevant statistics. Dr. Leonard

22   misinterprets and mischaracterizes the market research literature. He also relies on irrelevant articles

23   from environmental sciences and untested methods that aren't applicable to this case. His critiques

24   reveal a fundamental lack of understanding of choice-based-conjoint or statistical analyses. Every

25   observation made by Dr. Leonard ignores the robust and well-proven validity of choice-based-conjoint

26   and reflects Dr. Leonard's lack of experience and expertise in the field of market research.

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DECLARATION OF STEVEN M. SHUGAN ISO ORACLE'S MOTION TO EXCLUDE LEONARD AND COX
CASE NO. CV 10-03561 WHA

1   I declare under penalty of perjury that the foregoing is true and correct and that this declaration

2   was executed at Gainsville, Florida on October 21, 2011.

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5   By: _____

6   STEVEN M. SHUGAN

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DECLARATION OF STEVEN M. SHUGAN ISO ORACLE'S MOTION TO EXCLUDE LEONARD AND COX
CASE NO. CV 10-03561 WHA